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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

SEIFU, LESSANWORK T

ART UNIT

PAPER NUMBER

1797

MAIL DATE

DELIVERY MODE

06/19/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/541,027	Applicant(s) ICHIKAWA, YASUSHI	
	Examiner Lessanework T. Seifu	Art Unit 1797	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 March 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 and 15-25 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 17-25 is/are allowed.
- 6) ☒ Claim(s) 1-13, 15 and 16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. Claims 1-13, 15, and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Heil et al. (US 5,874,051).

Regarding claims 1-8 and 10-12, Heil et al. disclose a carbon monoxide oxidizer comprising a mixing unit that mixes at least two kinds of gases as a mixed gas, wherein the mixing unit is a static mixing structure (see col. 3, lines 50-67 and claim 2). Heil et al. disclose that the static mixing structure can be the same as the support units used in their disclosure to support selective CO oxidation catalyst (see col. 6, lines 18-35) or porous plates or other devices that have the required properties (see col. 4, lines 2-11).

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Heil et al. disclose that the provision of the static mixing structure is to promote uniform distribution and mixing of the mixed gas stream (see col. 2, lines 49-58). Applicant's limitations to the shape and configuration of the static mixer recited in claim 1 are not patentable distinctions over the prior art, because it is within the level of ordinary skill in the art to provide a static mixing structure having any number of shapes and configurations effective in promoting uniformed distribution and mixing of gases for the apparatus of Heil et al, which the reference discloses as suitable for use in motor vehicles powered by fuel cells.

Regarding claim 9, Heil et al. disclose that the carbon monoxide oxidizer of their invention, which comprises a static mixing structure provided upstream of a reaction chamber (see Fig. 1), further comprises a porous gas mixing structure provided at the bottom and top of the reaction chamber containing catalyst support units (see col. 6, lines 30-34). The above disclosure meets the limitation recited in claim 9.

Regarding claim 13, Heil et al. disclose that the carbon monoxide oxidizer of their invention comprises a carbon monoxide preferential oxidation catalyst carried on a porous body (see col. 3 lines 38-49). Heil et al. further disclose that the catalyst support unit is located downstream of the mixing unit (see Fig. 1).

Regarding claims 15 and 16, Heil et al. disclose that the carbon monoxide oxidizer of their invention comprises an oxidant gas introducing passage formed inside

the reactor module, which is also used as the alternative static mixing structure, with only the catalyst coating being omitted (col. 6, lines 39-51). Heil et al. further disclose that the oxidant gas introducing passage is formed in at least one of the plates that form the static mixing structure (see fig. 2).

Allowable Subject Matter

4. Claims 17-25 are allowed.

The following is a statement of reasons for the indication of allowable subject matter: The above claims are allowed because the prior art of record fails to disclose or render obvious the carbon monoxide oxidizer of claim 17 and 25 in which an orifice that reduces a cross-sectional area of a flow of reformat gas and wherein a chamber having a larger cross-sectional area than the cross sectional area of the orifice is provided in the mixing unit.

Response to Arguments

5. Applicant's arguments filed on March 10, 2008 have been fully considered but they are not persuasive. Applicant states that:

"The rotating passage as claimed in claim 1 is formed "to rotate a flow of the mixed gas," and therefore is not static. The rotating passage actually mixes the gases dynamically, not statically, by rotating the flow of the mixed gas. The static mixing structure disclosed in Heil actually teaches away from a rotating passage that is formed "to rotate a flow of the mixed gas" as presently claimed."

The examiner respectfully disagrees with the above argument. A fluid mixing structure with no moving parts is conventionally known as a static mixing structure. As such, the mixing unit in applicant's claimed invention is nothing more than a static mixing structure. Furthermore, the applicant has disclosed in the specification that the claimed mixing unit provides mixing by a static mechanism, not by a dynamic mechanism as applicant now asserts (see the specification at page 29, paragraph 2).

The examiner respectfully disagrees with applicant's argument that Heil et al. fail to teach or suggest "the stacked body comprising a rotating passage formed by a through hole formed in each of the plates". Heil et al. disclose that the static mixing structure can be the same as the support units used in their disclosure to support selective CO oxidation catalyst (see col. 6, lines 18-35) or porous plates or other devices that have the required properties (see col. 4, lines 2-11). The support units in the reference Heil et al. comprise a stacked body of a plurality of plates (P_1 to P_n) with thorough holes formed in each of the plates, which plates can be configured to form a rotating passage for a fluid to flow there through (see col. 5, lines 31-52 and Fig. 2). Accordingly, the reference Heil et al. does suggest a static mixing structure comprising a stacked body of a plurality of plates having a through hole formed in each of the plates.

Conclusion

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lessanework T. Seifu whose telephone number is (571)270-3153. The examiner can normally be reached on Mon-Thr 7:00am-5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Walter Griffin can be reached on 571-272-1447. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

LS

/Walter D. Griffin/
Supervisory Patent Examiner, Art Unit 1797